



MAY 2016

# SPACE LAUNCH SYSTEM HIGHLIGHTS



**ANOTHER  
PIECE OF  
SLS TEST  
HARDWARE  
MARKED  
COMPLETE**

# NASA COMPLETES TEST VERSION OF SLS LAUNCH STAGE ADAPTER

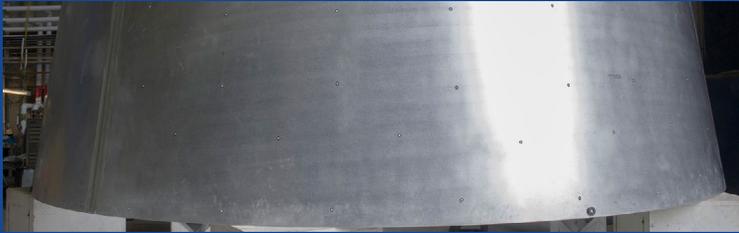
The structural test article of the launch vehicle stage adapter (LVSA) has completed final manufacturing at NASA's Marshall Space Flight Center in Huntsville, Alabama. The LVSA will connect two major sections of the upper part of NASA's Space Launch System – the core stage and the interim cryogenic propulsion stage (ICPS) – for the first flight of the rocket and the Orion spacecraft.

Later this year at Marshall, the test version of the LVSA will be stacked with other structural test articles of the upper part of SLS. Engineers will examine test data and compare it to computer models to verify the integrity of the hardware and ensure it can withstand the forces it will experience during flight. The hardware's cone shape is due to the ICPS having a smaller diameter than the rocket's core stage. Teledyne Brown Engineering of Huntsville is the prime contractor for the LVSA.

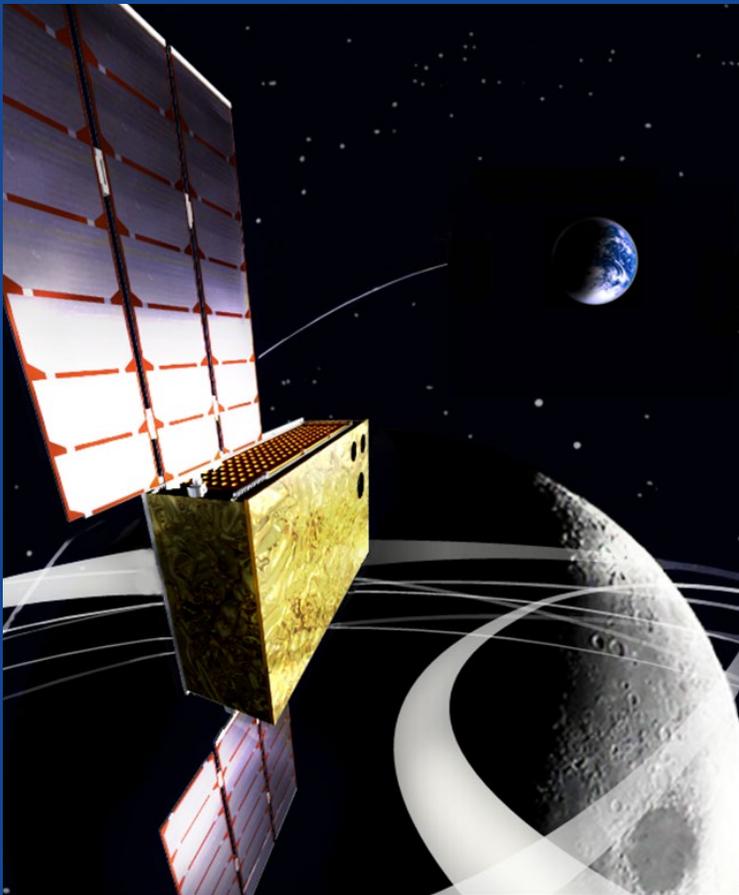
*Richard Johnson, a URS Corp. employee supporting Marshall's Engineering Directorate, checks out the massive structural test article of the SLS launch vehicle stage adapter.*

# INTERNATIONAL PARTNERS PROVIDE SCIENCE SATELLITES FOR AMERICA'S SPACE LAUNCH SYSTEM MAIDEN FLIGHT

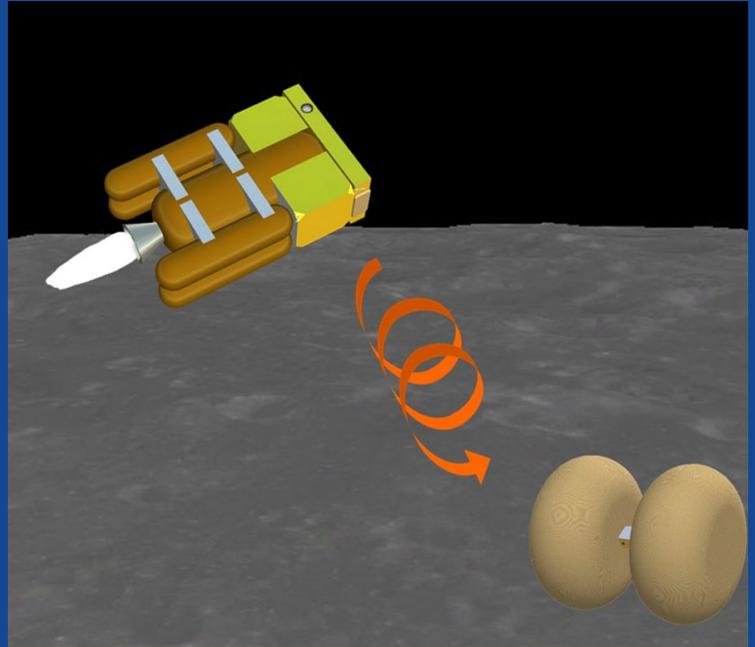
On the first flight of SLS, NASA will take advantage of additional available mass and space to provide the rare opportunity to send more than a dozen small satellites, called CubeSats, to conduct experiments beyond low-Earth orbit. In addition to the 10 CubeSats announced earlier this year, the agency will be sending three from international partners. [Read the full story here.](#)



All 13 secondary payloads will be mounted inside the SLS Orion Stage Adapter, which sits on top of the rocket, just below the Orion spacecraft. The main part of the ring-shaped adapter, shown here, was recently manufactured at the Marshall Center.



*EQUULEUS (EQUilibrUm Lunar-Earth point 6U Spacecraft) will measure the distribution of plasma that surrounds the Earth to help scientists understand the radiation environment in the region of space around Earth. It will also demonstrate low-energy trajectory control techniques, such as multiple lunar flybys, within the Earth-moon region. (JAXA/University of Tokyo)*



*OMOTENASHI (Outstanding MOon exploration TEchnologies demonstrated by NANO Semi-Hard Impactor) will demonstrate the technology for low-cost and very small spacecraft to land on the lunar surface. The CubeSat will also take measurements of the radiation environment near the moon as well as on the lunar surface. (JAXA/University of Tokyo)*



*ArgoMoon will demonstrate the ability to perform operations in close proximity of the ICPS. It will also record images of the ICPS for historical documentation and to provide valuable mission data on the deployment of other Cubesats. Additionally, this CubeSat will test optical communication capabilities between the CubeSat and Earth. (Argotec)*

# NASA CELEBRATES LOUISIANA'S CONTINUING ROLE IN HUMAN SPACE EXPLORATION



NASA celebrated the Louisiana workforce's participation on the journey to Mars at NASA Day in Baton Rouge at the Louisiana State Capitol on May 5. At 322 feet tall, the Block 1 SLS will stand about 128 feet shy of the height of the Capitol, which is 450 feet tall and the tallest Capitol in the United States. The SLS core stage is being built at the Michoud Assembly Facility outside New Orleans.



NASA Marshall Space Flight Center Director Todd May and astronaut Steve Bowen address the Louisiana State Senate on NASA Day in Baton Rouge on May 5. Read May's *op-ed* in "The Advocate" on the state's contributions to NASA's mission to Mars.

# PRECISE MEASUREMENTS ON EARTH ENSURE NASA'S BIG SPACECRAFT WORK IN SPACE

Measurement is the first step that leads to success. If you can't measure something accurately, you can't understand and improve it. That is especially true for giant rockets designed to operate under extreme temperatures and pressures at liftoff or space stations the size of a six-bedroom house that must support people living and working in space for years.

Researchers at the Metrology and Calibration Laboratory at the Marshall Center understand the importance of measurement accuracy, especially for SLS.

"We make sure every instrument that takes measurements during tests for the International Space Station or the Space Launch System or other NASA programs are accurate," said Gary Kennedy, technical representative for the Marshall Metrology and Calibration program. About 96 percent of Marshall's measurement and test equipment is calibrated through the lab in support of center operations, research and development, manufacturing, and testing for NASA projects. Story continues [here](#).



Metrology technician Joey Longino stands on the top of a 25-foot high, 750-thousand pound Gilmore machine to connect power prior to starting the calibration process.

# FACES OF SLS: JUSTIN LITTELL

*This funny, first-time dad is building test and flight hardware for SLS. Meet Justin Littell, a mechanical engineer at NASA's Marshall Space Flight Center.*

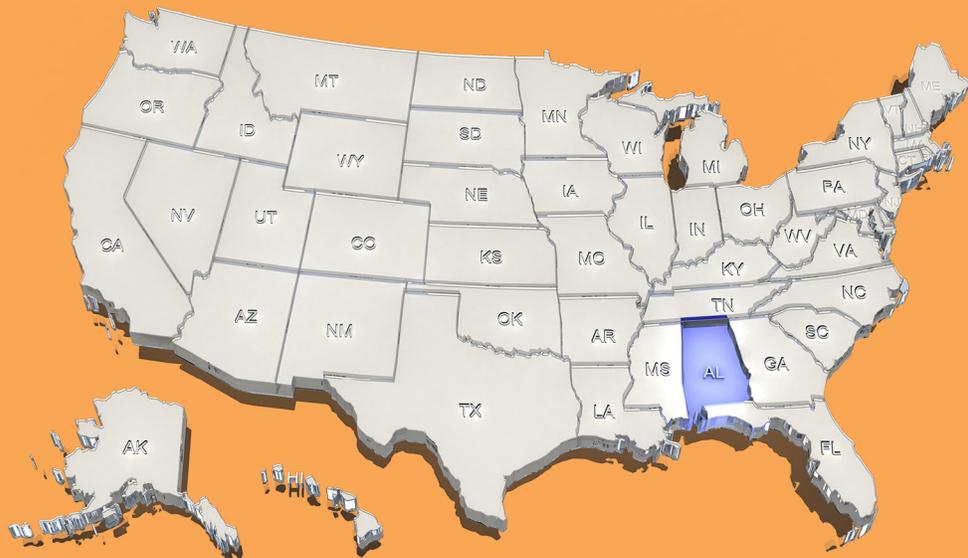


## SPACEFLIGHT PARTNERS: *Watring Technologies Inc.*



Core Stage

Block 1



### LOCATION:

*Huntsville, Alabama*

**NUMBER OF EMPLOYEES: 42**

### WHAT THEY DO FOR SLS:

Watring provides support to The Boeing Co. on systems engineering, structures analysis, and tooling and cable design for the SLS core stage.



# ROCKETOLOGY

NASA's Space Launch System

Follow our blog, "[Rocketology](#)," and go behind the scenes with us as we test and build the world's most powerful rocket for missions to deep space.

Comments and questions will be addressed on the SLS [Facebook page](#).

## SLS PART OF NASA GLENN'S 75TH ANNIVERSARY CELEBRATION

*A visitor checks out a model of the SLS on the mobile launcher at NASA Glenn Research Center's first public open house since 2008. The event, held May 21-22, celebrated Glenn's 75th anniversary. Among the many event activities, participants had the opportunity to walk through wind tunnels – which are crucial to testing environmental factors on rockets like SLS – and see where NASA tests tires for lunar and Mars rovers. ►*



## FOLLOW THE PROGRESS OF NASA'S NEW LAUNCH VEHICLE FOR DEEP SPACE:

- NASA SLS Rocketology Blog... [blogs.nasa.gov/Rocketology](https://blogs.nasa.gov/Rocketology)
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## COMING IN JUNE:

**Second SLS booster qualification test**

**ICPS delivered to Marshall**

**NASA in the Park**